

## **Meat Industry Food Safety Conference Highlights Research**

At the 2022 Meat Industry Food Safety Conference held on August 24-25 in Kansas City, MO, research funded by the Beef Checkoff stole the show. Over the two-day conference, five separate sessions presented post-harvest beef safety research funded by the Beef Checkoff, and administered by the Foundation, on a wide variety of topics including *Salmonella* classifications based on virulence; the variation in *E. coli* O157:H7 across time; the use of clean label antimicrobials in product formulations; and more. With over 200 food safety professionals across the industry in attendance, the wide variety of Beef Checkoff supported research has made an impact on food safety decisions today. There was also a pre-conference workshop on Appendices A&B using findings from research collaboratively supported by the Beef Checkoff, Beef Industry Food Safety Council, Foundation for Meat and Poultry Research and Education, U.S. Poultry and Egg Association to address the science on the cooking and cooling of meat products.

## **Foundation Secures FY23 Beef Checkoff Funding**

The Foundation for Meat and Poultry Research and Education received \$450,000 in FY23 to conduct research on behalf of the Beef Checkoff. Research will address post-harvest beef safety.

“The Foundation is thrilled to be able to continue to administer research on behalf of the Beef Checkoff,” said Susan Backus, President, Foundation for Meat & Poultry Research & Education. “The Checkoff investment in post-harvest beef safety research is critical to expanding the knowledge base; ensuring consumer and customer trust in beef products; and providing value to beef producers by demonstrating that beef products are safe and nutritious.”

Research funding will be used toward projects addressing current knowledge gaps; facilitating the dissemination of research data and knowledge sharing through meetings, or other events targeted to appropriate stakeholders; assessing research impact over time by cataloging citations for research funded by the Beef Checkoff and administered by the Foundation; developing tools that share post-harvest research results or summarizing research to provide guidance and information for beef processing facilities of all sizes.

Post-harvest beef safety research could address any appropriate research priorities identified by the Foundation’s Research Advisory Committee, which may include but are not limited to:

- investigating innovative *Salmonella* indicators for problematic lots of product;
- evaluating the effectiveness of implementing a *Salmonella* quantification based trim program on ground products;
- identifying and validating antimicrobial interventions to reduce pathogen contamination of raw ground beef components intended for use in ground products; and
- investigating efficient and sustainable application of antimicrobials to reduce pathogens on beef products.

## White House Conference on Hunger, Nutrition, and Health

The [White House Conference on Hunger, Nutrition, and Health](#) (Conference) was held on September 28, 2022 in Washington, DC. The [Biden-Harris Administration National Strategy on Hunger, Nutrition, and Health](#) (national strategy) was released in conjunction with the Conference. The national strategy is aligned around five pillars and calls for a whole-of-government and whole-of-America approach to address the challenges of hunger and diet-related diseases. The conference goal was to end hunger and increase healthy eating and physical activity by 2030, so fewer Americans experience diet-related diseases like diabetes, obesity, and hypertension.

The first, and only other, White House Conference on Hunger, Nutrition, and Health was hosted by President Nixon in 1969. It led to many of the nutrition programs established or expanded in the 1970s including food stamps (now SNAP) school lunch and breakfast, WIC (the Special Supplemental Feeding Program for Women, Infants and Children), The Emergency Food Assistance Program (TEFAP), and others. It also led to the creation of the nutrition labeling system.

The [national strategy](#) outlined several policy initiatives to improve access to healthy foods across five pillars.

1. **Improving food access and affordability**, including by advancing economic security; increasing access to free and nourishing school meals; providing Summer Electronic Benefits Transfer (EBT) benefits to more children; and expanding Supplemental Nutrition Assistance Program (SNAP) eligibility to more underserved populations;
2. **Integrating nutrition and health**, including by working with Congress to pilot coverage of medically tailored meals in Medicare; testing Medicaid coverage of nutrition education and other nutrition supports using Medicaid section 1115 demonstration projects; and expanding Medicaid and Medicare beneficiaries' access to nutrition and obesity counseling;
3. **Empowering all consumers to make and have access to healthy choices**, including by proposing to develop a front-of-package labeling scheme for food packages; proposing to update the nutrition criteria for the "healthy" claim on food packages; expanding incentives for fruits and vegetables in SNAP; facilitating sodium reduction in the food supply by issuing longer-term, voluntary sodium targets for industry; and assessing additional steps to reduce added sugar consumption, including potential voluntary targets;
4. **Supporting physical activity for all**, including by expanding the U.S. Department of Health and Human Services' Centers for Disease Control and Prevention's (CDC) State Physical Activity and Nutrition Program to all states and territories; investing in efforts to connect people to parks and other outdoor spaces; and funding regular updates to and promotion of the *Physical Activity Guidelines for Americans*; and
5. **Enhancing nutrition and food security research**, including by bolstering funding to improve metrics, data collection, and research to inform nutrition and food security policy, particularly on issues of equity and access; and implementing a vision for advancing nutrition science.

The White House announced more than [\\$8 billion in public and private sector commitments](#) to improve access to nutritious food, promote healthy choices, and increase physical activity.

## THANK YOU TO THE FOUNDATION'S 2022 CONTRIBUTORS

The Foundation is supported through generous contribution of companies and individuals. Company names with an asterisks (\*) indicate NAMI Board of Directors companies.

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### African Swine Fever Request for Proposals

Continuing the safe movement of pork products in the event of an African Swine Fever outbreak in North America is paramount. As such, research is needed to collect data on thermal inactivation of African Swine Fever virus (ASFv) for determining the required thermal processing and their equivalency in cooked pork meat. The Pork Checkoff and the Foundation for Meat and Poultry Research and Education solicited research proposals this fall to validate the minimum required thermal processing to ensure ASFv inactivation and establish a matrix of equivalency thresholds for time and temperature (or other critical operating parameters) to ensure ASFv inactivation during processing in further processed pork products. Research proposals should address swine inoculation; use U.S.-approved testing methods for ASFv diagnosis in swine that is based on Foreign Animal Disease Diagnostic Laboratory guidance; validate whether the current minimum time and internal temperature thresholds used for inactivation is effective for inactivating ASFv; and establish equivalent time and temperature thresholds that align with current processing methods, for inactivating ASFv in a variety of further processed pork products. Once research is identified for funding, project updates will be available in future issues of Foundation Focus.

## 2022-2023 RESEARCH ADVISORY COMMITTEE MEMBERS

The Foundation's Research Advisory Committee (RAC) develops meat and poultry research priorities which serve as the basis for the Foundation's research agenda and also communicates the areas of greatest research needs to the government, public and interested stakeholders. The RAC is made up of four subgroups across minimally processed (fresh) meat and poultry safety, further processed meat and poultry safety, nutrition sciences and product quality.

|   |   |
|---|---|
| <b>Emily Arkfeld, Triumph Foods</b>               | <b>Collette Kaster, American Meat Science Association</b>         |
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| <b>Sharon Beals, CTI Foods</b>                    | <b>Deidrea Mabry, American Meat Science Association</b>           |
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| <b>Ted Brown, Cargill, Inc.</b>                   | <b>Cindy Moore, Tyson Foods, Inc.</b>                             |
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| <b>Barry Hays, Bar S Foods</b>                    | <b>Tommy Wheeler, USDA, ARS, U.S. Meat Animal Research Center</b> |
| <b>Susan Jaax, Cargill, Inc.</b>                  | <b>Barry Wiseman, Triumph Foods</b>                               |

## 2022 BOARD OF DIRECTORS

The Foundation for Meat and Poultry Research and Education is governed by a Board of Directors, which provides scientific leadership and financial oversight, and acts upon recommendations from the Foundation's Research Advisory Committee. The North American Meat Institute's Executive Board is afforded the opportunity to serve on the Foundation's Board of Directors or appoint a designee to serve on their behalf. In an effort to broaden the scope of influence and direction, representatives from the livestock (beef, pork, poultry and egg), retail, academic, government agency and consumer sectors, among others, are invited to serve on the Board of Directors. Terms are for one year.

|  |  |
|--|--|
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| <b>Denise Heard, US Poultry and Egg Association</b>      | <b>Dennis Vignieri, Kenosha Beef International, Ltd.</b>   |
| <b>Megan Hobbs, Cargill, Inc.</b>                        | <b>Russell Yearwood, Indiana Packers Corporation</b>       |

## CURRENT FOUNDATION RESEARCH PROJECTS

### **Leveraging a current market hog lymph node study to further understand *Salmonella* transmission and internal colonization**

**Kansas State University, Texas Tech University, Triumph Foods**

This project will probe a possible relationship between *Salmonella* antibodies in oral fluids and internal colonization of market hog carcasses by determining if antibody testing of oral fluids can be used as an effective antemortem screening tool to assess a group/lot of pigs for *Salmonella* risk. Further, it will characterize internal colonization within market hogs by detecting and enumerating *Salmonella* in lymph nodes and tonsils, cecal contents, spleen, and oral fluids.

*Research funded in part by the National Pork Checkoff.*



### **Development and validation of an antimicrobial database to predict microbial load reduction on raw pork components against *Salmonella***

**University of Illinois at Urbana-Champaign**

This study will implement a high-throughput miniature assay to evaluate *Salmonella* reduction after pork carcass wash with antimicrobial treatments. Response surface methodology will be used to determine synergistic or antagonistic interactions between antimicrobials and optimize combinations to reach desired *Salmonella* reductions. The results are intended to validate the predicted interactions between antimicrobials in laboratory experiments, as well as build an antimicrobial database in which additional antimicrobial treatments data can be added as new compounds become relevant against *Salmonella* in pork.

*Research funded in part by the National Pork Checkoff.*



### **Exploring the use of ProbiCon as a direct-fed microbial to reduce the *Salmonella* burden in market hogs**

**Kansas State University, USDA-ARS-U.S. Meat Animal Research Center, Triumph Foods**

This study will evaluate the influence of direct fed microbials (DFM) on pig performance, morbidity, and mortality throughout the feeding period. The feces and mesenteric lymph nodes of market hogs fed a control or DFM augmented diet will be collected to establish the impact of each diet on *Salmonella* internalized in the lymphatic system. By determining *Salmonella* serotype and presence of highly pathogenic *Salmonella* (HPS), it evaluates whether *Salmonella* diversity and/or presence of HPS is impacted by probiotic administration.

*Research funded in part by the National Pork Checkoff.*



### **Dietary modeling the nutritional impact of removing/adding/substituting meat and poultry servings to the healthy dietary patterns**

**Nutrition Impact LLC, NutriScience LLC**

This project will model the effect of removing or adding a serving of minimally processed and further processed meat and poultry or substituting a serving of various foods with a serving of minimally processed and further processed meat and poultry on nutrient profiles in the healthy dietary patterns identified in the Dietary Guidelines for Americans, 2020-2025.

*Research funded in part by the Beef Checkoff.*



Funded by Beef Farmers  
and Ranchers

### **Effects of helium gas utilization in Modified Atmosphere Packaging (MAP) on beef quality**

**Texas A&M AgriLife**

This project will determine if the inclusion of various levels of helium gas in modified atmosphere packaging (MAP) impacts color shelf-life or microbiological reductions on steaks surfaces.

## CURRENT FOUNDATION RESEARCH PROJECTS (CONT.)

### **Effect of clean label antimicrobials on the inhibition of *Clostridium perfringens* and *Bacillus cereus* during extended cooling of uncured beef and poultry products**

**University of Wisconsin-Madison, Cargill**

This study will compare the effect of clean label antimicrobial ingredients on the inhibition of *Clostridium perfringens* and *Bacillus cereus* in model uncured beef and poultry products, having different moisture, pH, and salt contents, primarily focusing on extending Phase 1 cooling from 120 to 80°F.

*Research funded in part by the Beef Checkoff.*



### **A Cross-Sectional Investigation of *Salmonella* in Market Hog Lymph Nodes**

**Kansas State University, Texas Tech University, Triumph Foods, LLC, Smithfield Foods, Inc., JBS Foods, Clemens Food Group**

A cross-sectional study design will investigate the prevalence and concentration of *Salmonella* in up to 6 lymph nodes and tonsils of market hogs. Prevalence and concentration data will be subsequently used to design a risk-assessment mapping of the carcass for prioritization of node-removal for pathogen control. The study also intends to address knowledge gaps regarding *Salmonella* prevalence by region and/or season in the United States.

*Funded in part by the National Pork Checkoff.*



### **Improving Validation Methods for *Salmonella* Lethality on the Surface of Multiple Impingement-Cooked Meat and Poultry Products,**

**Michigan State University, University of Wisconsin**

The study will identify critical limits (i.e., humidity, air velocity, surface time-temperature), relative to achieving target *Salmonella* lethality on the surface of impingement-cooked products. A spreadsheet-based solution for calculating surface lethality of *Salmonella* on multiple products will be developed and cross-validated. Findings are intended to improve the ability of the meat and poultry industry to comply with Appendix A requirements.

*Research funded in part by the Beef Checkoff and the National Pork Checkoff.*



### **Effects of proportioning meat and plant-based protein-rich foods within the U.S. Healthy Eating Pattern on cardiovascular disease risk factors**

**Purdue University**

This project will assess the effects of consuming different proportions of red meat and plant-based, protein-rich foods incorporated into a U.S. Healthy Eating Pattern on cardiovascular disease risk factors in adults at high risk of developing a heart-related disease.

*Research funded in part by the Beef Checkoff.*



### **Meat as a First Solid Food on Risk of Overweight and Neurodevelopment in Infants**

**University of Colorado Anschutz Medical Campus, University of Colorado Denver**

Early complementary feeding is a unique and malleable period to prevent rapid weight gain and later obesity, and is also a critical phase for neurodevelopment. Meat is an excellent source of high-quality protein and micronutrients, which are critical for the normal development of older infants. This research will conduct a randomized controlled trial to comprehensively evaluate the effect of meat on growth, body composition, risk of overweight and neurodevelopment, with a protein intake at the reported population median. Findings from this study will be generalizable and help inform future dietary guidance.

*Research funded in part by the Beef Checkoff.*



### Tests of *Salmonella* Sub-unit Proteins as Vaccines for Broiler Chickens

**USDA-ARS U.S. National Poultry Research Center**

This project will identify the *Salmonella* protein antigens able to induce humoral immune response in broilers, and consequently these antibodies can prevent *Salmonella* colonization in the broiler gastrointestinal tracts.

## FUNDED BY NATIONAL PORK CHECKOFF AND ADMINISTERED BY THE FOUNDATION

### Risk assessment model to assess the impact on public health of pork based on the contamination level and presence of highly virulent or multidrug resistant strains

**University of Minnesota**

This project will build upon a risk assessment model developed using existing FSIS prevalence and enumeration data to assess the impact of raw pork characterized by contamination level and presence of highly virulent or multidrug resistant strains on public health. Results of this model could evaluate potential impact on public health of model performance standards based on *Salmonella* spp. enumeration level and strain characteristics to reduce the number of human cases due to pork consumption.

## FUNDED BY BEEF CHECKOFF AND ADMINISTERED BY THE FOUNDATION

### Novel TaqMan assays for the specific detection and simultaneous differentiation of virulent and avirulent non-O157 Shiga toxin-producing *Escherichia coli* strains

**Florida State University, USDA-ARS, U.S. Meat Animal Research Center**

This study intends to standardize six multiplex TaqMan assays for the identification of virulent strains of *E. coli* O26, O111, O45, O103, O121, and O145 serogroups. Further, it will demonstrate the applicability of the standardized assays in inoculated food samples and red meat enrichments from national red meat surveillance programs through a direct comparison with the FSIS MLG 5C.01 reference method.

### Impact of sanitization and natural biofilm communities on *Salmonella* prevalence at processing plants

**USDA-ARS, U.S. Meat Animal Research Center**

This study will evaluate the efficacy of commercial sanitizers against *Salmonella* harbored within environmental mixed biofilms by measuring biofilm forming ability and community structure of environmental biofilms before and after sanitization. It will compare environmental microbial communities and *Salmonella* survival in mixed biofilms before and after sanitization to determine the impact of different sanitizers on controlling *Salmonella*.

### Risk assessment model to assess the impact on public health of ground beef lots based on the contamination level and presence of highly virulent or multidrug resistant strains

**University of Minnesota**

This project will develop a risk assessment model using existing Food Safety and Inspection Service prevalence and enumeration data to assess the impact of ground beef lots characterized by contamination level and presence of highly virulent or multidrug resistant strains on public health. Results of this model could be used to evaluate potential impact on public health of model performance standards based on *Salmonella* spp. enumeration level (CFU/g) and strain characteristics to reduce the number of human cases due to ground beef consumption.

**Evidence-based, quantitative risk assessment to control salmonellosis attributable to ground beef: Evaluating and mitigating the contribution of lymph nodes to *Salmonella* contamination, University of Nebraska-Lincoln, U.S. Meat Animal Research Center, USDA ARS, Michigan State University, The University of Vermont, University of California**

This project will characterize the distribution of both prevalence and concentration of *Salmonella enterica* in bovine deep tissue lymph nodes (DTLNs) by lymph node type, production source, region and season using systematic review and meta-analysis approaches. The relative contributions of DTLNs and the efficacy of their removal at processing on salmonellosis risk associated with ground beef consumption will be evaluated using a quantitative microbial risk assessment approach.

**Using empirical evidence, modeling, and risk assessment methods to estimate the public health impact of incorporating enumeration and virulence as part of the criteria for evaluation of *Salmonella* contamination in ground beef in the US**

**EpiX Analytics, Colorado State University**

This project will develop a quantitative microbial risk assessment to assess the potential public health impact of incorporating enumeration and virulence evaluation strategies as part of the criteria for evaluation of *Salmonella* contamination in ground beef in the U.S. Additionally, using existing surveillance data the effect of season and regional sources of the live cattle on changes in *Salmonella* prevalence, virulence, and enumeration in ground beef and trim will be estimated.

**Effect of Minimally Processed Meat and Further Processed Meat on Biomarkers and Risk Factors for Cancer and Cardiovascular Disease—Phase I**

**USDA-ARS-Beltsville Human Nutrition Research Center**

A randomized diet controlled crossover study will be conducted with diets containing either minimally processed or further processed meat to assess how the diet effected biomarkers associated with cardiovascular disease. This study will also examine the effect of the background diet on health outcomes.

*Funded by the Foundation for Meat and Poultry Research and Education and the National Cattlemen's Beef Association (NCBA) on behalf of the Beef Checkoff. NCBA has primary oversight responsibility for this project.*

**FOUNDATION EDUCATION SCHEDULE**

**Fall 2022 Advanced *Listeria monocytogenes* Intervention and Control Workshop**

November 2-3, 2022  
Kansas City, MO

[Click here](#) for more details on events

**Annual Meat Conference**

March 6-8, 2023  
Dallas, TX

**Environment, Labor and Safety Conference**

April 18-20, 2023

